

WHAT IS CLAIMED IS:

1. An optical head apparatus comprising:

an object lens which condenses light beams onto
a recording surface of an information recording medium
5 or the like which records information;

a lens holder which holds the object lens so as to
be movable in an optical axis direction of the object
lens and a direction parallel with the recording
surface of the information recording medium;

10 a magnet which can provide a magnetic field having
a predetermined polarity;

a flat coil which has a conductor composed of
a metal foil or a metal pattern and formed into a coil
shape on a sheet medium at a predetermined position
15 of the lens holder and which generates a force in
accordance with the magnetic field in order to move
the lens holder at least in one of the optical axis
direction and the direction parallel with the recording
surface; and

20 a support member which supports the lens holder so
as to be movable in predetermined directions.

2. The optical head apparatus according to
claim 1, wherein the flat coil is formed by laminating
a plurality of sheet mediums having the metal foil or
25 the metal pattern formed thereon.

3. The optical head apparatus according to
claim 2, wherein the flat coil includes a coil having

a first pattern which generates a thrust in a first direction in order to move the lens holder at least in the optical axis direction, and a coil having a second pattern which generates a thrust in a second direction
5 orthogonal to the first direction in order to move the lens holder at least in the direction parallel with the recording surface.

4. The optical head apparatus according to claim 2, wherein the two or more flat coils are
10 provided with a magnetic body sandwiched therebetween.

5. The optical head apparatus according to claim 2, wherein the flat coil includes a coil having a third pattern which generates a third thrust in order to move the lens holder in the first direction in
15 accordance with a displacement of the first direction based on a rotation cycle of the recording medium.

6. The optical head apparatus according to claim 1, wherein the flat coil is formed by folding and laminating a plurality of sheet mediums having
20 a predetermined shape to which the metal foil or the metal pattern is formed.

7. The optical head apparatus according to claim 6, wherein the flat coil includes a coil having a first pattern which generates a thrust in a first
25 direction in order to move the lens holder at least in the optical axis direction, and a coil having a second pattern which generates a thrust in a second direction

orthogonal to the first direction in order to move the lens holder at least in the direction parallel with the recording surface.

8. The optical head apparatus according to
5 claim 6, wherein the two or more flat coils are provided with a magnetic body sandwiched therebetween.

9. The optical head apparatus according to
claim 6, wherein the flat coil includes a coil having
a third pattern which generates a third thrust in order
10 to move the lens holder in the first direction in
accordance with a displacement of the first direction
based on a rotation cycle of the recording medium.

10. An optical head apparatus comprising:
an optical head which has: an object lens which
15 condenses light beams onto a recording surface of an
information recording medium or the like which records
information; a lens holder which holds the object lens
so as to be movable in an optical axis direction of the
object lens and a direction parallel with the recording
20 surface of the information recording medium; a magnet
which can provide a magnetic field having a predeter-
mined polarity; a flat coil which has a conductor
composed of a metal foil or a metal pattern and formed
into a coil shape on a sheet medium at a predetermined
25 position of the lens holder and which generates a force
in accordance with the magnetic field in order to move
the lens holder at least in one of the optical axis

direction and the direction parallel with the recording surface; and a support member which supports the lens holder so as to be movable in predetermined directions;

a photodetector which detects light beams
5 reflected on the recording surface of the recording medium and converts them into an electric signal; and
an information processing circuit which reproduces information recorded in the recording medium from the electric signal outputted from the photodetector.

10 11. The optical head apparatus according to claim 10, wherein the flat coil is formed by laminating a plurality of sheet mediums to which the metal foil or the metal pattern is formed.

12. The optical head apparatus according to
15 claim 11, wherein the flat coil includes a coil having a first pattern which generates a thrust in a first direction in order to move the lens holder at least in the optical axis direction, and a coil having a second pattern which generates a thrust in a second direction
20 orthogonal to the first direction in order to move the lens holder at least in the direction parallel with the recording surface.

13. The optical head apparatus according to claim 11, wherein the two or more flat coils are
25 provided with a magnetic body sandwiched therebetween.

14. The optical head apparatus according to claim 10, wherein the flat coil is formed by folding

and laminating a plurality of sheet mediums having a predetermined shape to which the metal foil or the metal pattern is formed.

15 15. The optical head apparatus according to
5 claim 14, wherein the flat coil includes a coil having
a first pattern which generates a thrust in a first
direction in order to move the lens holder at least in
the optical direction and a coil having a second
pattern which generates a thrust in a second direction
10 orthogonal to the first direction in order to move the
lens holder at least in the direction parallel with the
recording surface.

15 16. The optical head apparatus according to
claim 14, wherein the two or more flat coils are
15 provided with a magnetic body sandwiched therebetween.